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FINAL REPORT

HAVRE SCS 31
HILL COUNTY, MONTANA

JANUARY, 1986

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Abandoned Mine Reclamation Bureau
Department of State Lands
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HAVRE SCS 31

SCOPE

The objective of this project was to lessen the impact of an abandoned coal mine on both the environment and the safety and general welfare of the public. This reclamation included disposing of two coal waste piles, backfilling of mine openings and recent surface subsidence, and cleanup of debris. The scope of the project was limited to primarily surface reclamation of recent subsidence (less than two years old) and mine waste (gob and spoil) disposal. Complete reclamation of the mine was not considered economically justifiable.

PROJECT LOCATION

The site is located on the west side of Montana 232 approximately two miles north of Havre, Montana. A county road crosses the site. The legal description is the NW 1/4 of Section 31 and the S 1/2 SW 1/4 of Section 30, Township 33 North, Range 16 East in Hill County, Montana.

HISTORY

Coal was mined on this site from the early 1900's until around 1930. The mine was named "The Havre Coal Company". The name was later changed to "The Electric Mine". This mine was the largest mine in the area and included electric lights and cars in the mine and an electric railroad to haul the coal to the main railroad line at Havre. The early mining was done by the room and pillar method. The planned electrification and expansion of the mine, including the electric railroad, was reported in the Havre Plainsdealer on April 20, 1907. According to this article, the long-wall system of mining was to be used once the expansion was completed. Little other information is available on the operation of this mine and it appears to have ceased production sometime in the 1920's or 1930's.

SURFACE CONDITION

The primary use of the site is cattle grazing. The site is vegetated with native grasses and sage brush. Several natural depressions or pan spots exist and those spots support little vegetation. The site is bordered on the west by a crop field, on the north by grazing land, on the east by Montana Highway 232, and on the south by several coulees providing drainage to the Milk River. A county road crosses the site from southeast to northwest.

Two large and one small waste pile and a considerable amount of subsidence were the primary evidence of past mining. The two large waste piles were located at what appears to be the major mine entrances. Pile one was located north of the county road in the northeast portion of the site. Pile two was located in the south central area of the site. These two piles were disposed of in pits located adjacent to the pile. The third pile was located north of the county road in the northwest portion of the site. This pile had been partially removed and the remaining waste was supporting vegetation. This pile was limed in place.

Approximately 12 acres north of the county road is heavily subsided. Subsidence is appearing at the surface every year in the form of sink holes. The majority of the subsidence holes are several years old and have rounded sides and are completely vegetated. Some additional subsidences are located south of the county road near old mine entries. Several subsidence holes have been used as dumps for agricultural and residential wastes and a considerable amount of this waste along with some mining debris was scattered about the site.

PROJECT PLANNING

Project planning began in 1983 with site mapping, preliminary site visits, and interviews with local landowners and residents. The initial information indicated that a farmhouse and corrals located

adjacent to the west edge of the site and the county road may be undermined. A program of resistivity testing and exploratory drilling was set up to investigate these hazards.

The resistivity testing was conducted by Geo Science and Engineering of Billings, Montana. Resistivity lines were run near the farm buildings and along the county road. A limited amount of exploratory drilling was performed in an attempt to confirm the resistivity results. At this point the farmer that owned the farmhouse and corrals decided that he did not want to participate in the Abandoned Mine Lands program and further worked around his house was suspended. The resistivity lines along the county road were generally inconclusive due primarily to the variability of the glacial till, groundwater, and the existing fence lines. Three exploratory boreholes were drilled along or next to the road at locations suggested by the resistivity work. The mine was not encountered in these boreholes. The drilling along the county road showed that the depth to the top of what was believed to be the mined coal seam varied from about 38 feet to about 83 feet. Preliminary exploratory drilling was completed in March 1984. After evaluation of the preliminary exploratory information, it was decided that additional exploration along the county road was not warranted at this time. The road should be monitored for any future signs that may indicate the location of any possible undermining. The scope of the project was then set at primarily surface reclamation.

Several possibilities were considered for surface reclamation at this site. Some alternates considered were regrading of the entire 12 acres of heavy subsidence, borrow backfilling all subsidence, using coal waste for subsidence backfill, disposing of the waste by flushing into mine voids, and disposal of the waste by burial in pits. The expected end use for this site is cattle grazing. The older subsidence features that have stabilized and are vegetated do not pose a major hazard to this end use so it was decided to limit reclamation work to backfilling the more recent subsidence features, disposing of coal waste, and debris cleanup. Testing showed the coal waste to be a highly sodic

soil so it was determined that the best disposal method would be burial in pits. Pile 1, on the northeast part of the site, was partially burned. The baked residue at this pile was nontoxic so this pile was to be segregated in the pit and the burned and baked material was to be placed on top of the other coal waste in order to retard the sodification of the cover soils. Pile 2, on the south central area of the site, was to be placed in the pit and then covered with a layer of clean sand to act as a choker to prevent contamination of the overlying soils. The third pile had been partly removed and consisted of a thin layer of waste. This pile was partly vegetated and complete disposal of this pile would cause more damage than it was worth so reclamation was limited to liming in place.

HAVRE SCS 31 was scheduled for construction during the 1985 construction season.

WORK DESCRIPTION

On June 13, 1985 bids were opened for HAVRE SCS 31. The low bidder was Swan and Sons Construction of Anaconda, Montana. By mutual agreement between the Contractor and the Department of State Lands, the "Notice to Proceed" was delayed and finally specified as starting date of August 1, 1985. Work actually began on August 8, 1985 and progressed at a reasonable rate. Work was essentially completed by September 6, 1985. The Contractor returned in October to seed the project and all work was completed on October 3, 1985.

Several new subsidence holes opened between the time of plan preparation and construction. Consequently, at the start of construction it was apparent that the quantity in the Contract for subsidence backfill would be overrun. It was decided that the backfill material would be supplemented by some of the burned and baked waste in Waste Pile 1. This baked material was placed into deep subsidences and then water flooded to consolidate the material and to flush it into the deeper portion of the subsidence or into the mined seam.

A formal Change Order was not necessary to implement this work since the bid items in the Contract were sufficient to complete the work and the Contractor was agreeable to the change. See Photos 1 through 6 for examples of this work.

QUANTITY SUMMARY

The following is a summary of the primary reclamation items for this project:

Salvage and Replace Topsoil	1546 C.Y.
Close Mine Opening, Adit	1 Each
Subsidence Backfill	1827 C.Y.
Waste Pile Disposal	8841 C.Y.
Disposal Pit Excavation	7301 C.Y.
Type F-3 Farm Fence	2871 L.F.
Seeding, Fertilizing, Mulching	6.17 Acre
TOTAL CONSTRUCTION COST	$ 42,637.85
Mine Area Reclaimed	4.5 Acre
Cost Per Acre	$ 9,475.00

COMMENTS

The project progressed smoothly through construction and overall Swan and Sons performed good work in accordance with the Contract.

The final project was approved by both the Department of State Lands and L. C. Hanson Company.

HAVRE SCS 31

PHOTO LOG

1.	August 15, 1985	Typical recent subsidence hole prior to reclamation.
2.	August 15, 1985	Water flooding subsidence shown in Photo 1.
3.	August 19, 1985	Recent subsidence hole prior to reclamation.
4.	August 19, 1985	Same subsidence hole shown in Photo 3.
5.	August 19, 1985	Subsidence hole shown in Photos 3 and 4 during backfill and flushing with baked coal waste.
6.	August 19, 1985	Subsidence hole shown in Photos 3, 4, and 5 after backfilling with baked coal waste.
7.	August 19, 1985	Subsidence shown in Photos 3 thru 6 after completion of backfilling and grading.
8.	August 20, 1985	Same as Photo 7.
9.	October 1, 1985	Drill seeding and fertilizing disposal pit by Waste Pile 2.
10.	October 1, 1985	Lime placed on Waste Pile P-3.
11.	October 1, 1985	Hand raking lime placed on P-3.
12.	October 1, 1985	Drill seeding old adit location.
13.	October 3, 1985	Vegetative mulch placed on backfilled subsidence.